

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 10 October 2000 (10.10.00)	
International application No. PCT/US00/04573	Applicant's or agent's file reference 44484
International filing date (day/month/year) 23 February 2000 (23.02.00)	Priority date (day/month/year) 24 February 1999 (24.02.99)
Applicant GARTNER, Herbert, A. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 23 August 2000 (23.08.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Henrik Nyberg

Telephone No.: (41-22) 338.83.38

The mixture is put on the shaking machine overnight and the resulting extract is injected into a liquid chromatograph. Separation is made on a cation exchange column and the eluent is monitored with an ultraviolet detector. Quantification is made by peak areas measurement using external standard calculations with a computing integrator.

5 D) Particle Size

The particle sizes of the SAP's of the present invention were determined by the scanning electron microscopy (SEM) technique followed by image analysis.

Table 1 - Recipe for 1 kg Water-in-Oil Emulsion having 90 Percent Aqueous Phase

Aqueous Phase* ¹ 90 percent, based on total			
Ingredient	Weight(g)	Concentration in Formula.	Comments
Acrylic acid (AA)	263.44	29.27	wt percent b.o. aqueous Phase
Sodium hydroxide (20 percent aq.)	497.62		
Water	132.03		
Crosslinker ²			
Versenex 80	0.33	500	ppm b.o. AA
Sodium persulfate	4.48	1700	ppm b.o. AA
Hydrogen peroxide ³			ppm b.o. AA
2,2'-Azobis(2- amidinopropane) dihydrochloride ⁴	2.11	800	ppm b.o. AA
TOTAL	900.00		

*35 percent by weigh solids, based on aqueous phase

WHAT IS CLAIMED IS:

1. A process for preparing superabsorbent structures comprising:
 - (a) preparing a high internal phase water-in oil emulsion comprising, in its aqueous dispersed phase, at least one hydrophilic monomer in aqueous solution and an initiator,
 - (b) polymerizing the monomer in the aqueous dispersed phase to form a precursor polymer,
 - (c) mixing the water-in-oil emulsion containing the precursor polymer with a post crosslinker and, optionally a plasticizing agent,
 - (d) applying the emulsion resulting from step (c) onto a support material,
 - (e) allowing or inducing coalescence of the aqueous phase under conditions sufficient to allow the emulsion to form a homogeneous polymer gel structure, and
 - (f) drying and post crosslinking the formed gel material at a temperature sufficient to dry and cure the material, and
 - (g) optionally, post-treating the material obtained in step (f) by post-heat treating the material, by surface modifying the material, by surface post-crosslinking the material, or by any combination of these post-treatments.
2. A process for preparing superabsorbent structures comprising:
 - (a) preparing a high internal phase water-in oil emulsion containing, in its aqueous dispersed phase, a least one hydrophilic monomer in aqueous solution and a suitable initiator,
 - (b) polymerizing the aqueous dispersed phase to form a precursor polymer,
 - (c) mixing the water-in-oil emulsion containing the precursor polymer with a post-crosslinker, an inversion agent, and, optionally a plasticizing agent,
 - (d) spreading or casting the emulsion resulting from step (c) on a support material into a film, shape or pattern,
 - (e) allowing the spread or cast emulsion to invert from a water-in-oil emulsion into a oil-in-water emulsion for a time sufficient to allow the emulsion to invert and for the polymer material to form a homogeneous polymer gel structure, and
 - (f) drying and post crosslinking the formed gel material at a temperature sufficient to dry and cure the material, and
 - (g) optionally, post-treating the material obtained in step (f) by post-heat treating the material, by surface modifying the material, by surface post-crosslinking the material, or by any combination of these post-treatments.

3. A process according to Claims 1 or 2 wherein the inversion of the emulsion can be accomplished by 1) solvent extraction, 2) evaporation of the organic phase, 3) application of surfactant(s) having a high hydrophilic lipophilic balance (HLB), 4) application of low critical solution temperature solvents, or 5) application of metal oxide
5 powders.
4. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by solvent extraction.
5. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by evaporation of the organic phase.
- 10 6. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one surfactant having a high hydrophilic lipophilic balance (HLB).
7. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one low critical solution temperature (solvent.
- 15 8. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one metal oxide powder.
9. A film prepared by the process of Claims 1 or 2.
10. An absorbent article which comprises a superabsorbent polymer film or pattern prepared from a high internal phase polyelectrolyte prepared by the process of
20 Claims 1 or 2.
11. A high internal phase polyelectrolyte emulsion which is useful for the manufacture of a superabsorbent polymer, the emulsion having two phases: i) a continuous oil phase and ii) a dispersed aqueous phase containing polyelectrolyte, wherein the dispersed aqueous phase contains a concentration of polyelectrolyte which is from 10 to 50
25 percent, based on the total aqueous phase.
12. An emulsion according to Claim 11 wherein the oil phase is a hydrophobic organic solvent.

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 44484	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 04573	International filing date (day/month/year) 23/02/2000	(Earliest) Priority Date (day/month/year) 24/02/1999
Applicant THE DOW CHEMICAL COMPANY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established by this Authority to read as follows:

MANUFACTURE OF SUPERABSORBENTS IN HIGH INTERNAL PHASE EMULSIONS

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.
- ☐ None of the figures.

INTERNATIONAL SEARCH REPORT

National Application No

PCT/US 00/04573

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61L15/24 A61L15/60 //C08F2/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 349 240 A (NIPPON CATALYTIC CHEM IND) 3 January 1990 (1990-01-03) page 4, line 16 -page 5, line 6 page 7, line 6 - line 32 example 1 ---	1-12
X	EP 0 842 952 A (ELF ATOCHEM) 20 May 1998 (1998-05-20) page 2, line 46 - line 57 page 3, line 8 - line 40 ---	1-12
X	WO 99 00187 A (BIOPORE CORP) 7 January 1999 (1999-01-07) page 3, line 24 -page 4, line 8 page 29, line 21 - line 35 ---	1-12
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

30 June 2000

Date of mailing of the international search report

11/07/2000

Name and mailing address of the ISA

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Authorized officer

Diederer, J

INTERNATIONAL SEARCH REPORT

ational Application No
PCT/US 00/04573

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 387 207 A (DYER JOHN C ET AL) 7 February 1995 (1995-02-07) column 4, line 22 - line 48 column 20, line 7 -column 22, line 50 -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/04573

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0349240	A	03-01-1990	CZ 8903902 A	13-04-1994
			CZ 8903903 A	13-04-1994
			DE 68927027 D	02-10-1996
			DE 68927027 T	03-04-1997
			DE 68927944 D	15-05-1997
			DE 68927944 T	18-09-1997
			EP 0349241 A	03-01-1990
			JP 2191604 A	27-07-1990
			JP 2574032 B	22-01-1997
			KR 9307272 B	04-08-1993
			KR 9307306 B	05-08-1993
			US 4973632 A	27-11-1990
			US 5026800 A	25-06-1991
			US 5244735 A	14-09-1993
			JP 2930555 B	03-08-1999
			JP 9309916 A	02-12-1997
			JP 2196802 A	03-08-1990
			JP 6025209 B	06-04-1994
EP 0842952	A	20-05-1998	FR 2755693 A	15-05-1998
			CA 2219192 A	14-05-1998
			CN 1184115 A	10-06-1998
			JP 2945362 B	06-09-1999
			JP 10147606 A	02-06-1998
			US 5994419 A	30-11-1999
WO 9900187	A	07-01-1999	US 6048908 A	11-04-2000
			AU 8154298 A	19-01-1999
			EP 0993337 A	19-04-2000
US 5387207	A	07-02-1995	US 5260345 A	09-11-1993
			US 5352711 A	04-10-1994
			US 5198472 A	30-03-1993
			US 5149720 A	22-09-1992
			US 5318554 A	07-06-1994
			US 5147345 A	15-09-1992
			AT 176245 T	15-02-1999
			AU 693773 B	09-07-1998
			AU 5680394 A	04-07-1994
			BR 9307630 A	08-09-1999
			CA 2151279 A	23-06-1994
			CN 1090863 A	17-08-1994
			CZ 9501402 A	17-01-1996
			DE 69323324 D	11-03-1999
			DE 69323324 T	26-08-1999
			EG 20487 A	31-05-1999
			EP 0673393 A	27-09-1995
			ES 2126738 T	01-04-1999
			FI 952854 A	09-06-1995
			HU 75859 A	28-05-1997
			JP 8504474 T	14-05-1996
			MX 9307847 A	29-07-1994
			NO 952055 A	24-05-1995
			NZ 258765 A	22-08-1997
			SG 54169 A	16-11-1998
			TR 28238 A	20-03-1996
			WO 9413704 A	23-06-1994
			US 5652194 A	29-07-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/04573

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5387207 A		US 5649920 A	22-07-1997
		AU 671955 B	19-09-1996
		AU 2485692 A	16-03-1993
		BR 9206361 A	01-03-1995
		CA 2114524 A,C	04-03-1993
		CN 1071437 A,B	28-04-1993
		CZ 9400302 A	13-07-1994
		EG 19702 A	31-10-1995
		EP 0598062 A	25-05-1994
		FI 940652 A	14-03-1994
		HU 68794 A,B	28-07-1995
		JP 6509834 T	02-11-1994
		MX 9204673 A	01-03-1993
		NO 940454 A	12-04-1994
		NZ 243907 A	26-09-1995
		PL 171302 B	28-03-1997
		PT 100772 A,B	30-09-1993
		SG 66242 A	20-07-1999
		SK 15494 A	05-10-1994
		TR 26941 A	29-08-1994
		US 5292777 A	08-03-1994
		WO 9304115 A	04-03-1993

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 31 MAY 2001

WIPO PCT

Applicant's or agent's file reference 44484	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/04573	International filing date (day/month/year) 23/02/2000	Priority date (day/month/year) 24/02/1999
International Patent Classification (IPC) or national classification and IPC A61L15/24		
Applicant THE DOW CHEMICAL COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.



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3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 23/08/2000	Date of completion of this report 29.05.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Staber, B Telephone No. +49 89 2399 8587 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/04573

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-17,19-31	as originally filed	
18	with telefax of	17/04/2001

Claims, No.:

1-12	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/04573

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	11, 12
Inventive step (IS)	Yes:	Claims	1-10
	No:	Claims	11, 12
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

- 2. Citations and explanations**
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Section I

The amended set of claims filed on 17.04.2001 does not fulfil the requirements of Art. 34(2)b) PCT since it contains subject-matter which goes beyond the disclosure in the international application as filed, and as such they are not taken into account in the establishment of the report. The claims which are concerned are claims 2 and 11: Claim 2 fails to indicate that the inversion agent is additionally employed in step (c), together with a precursor polymer and a post cross-linker.

Claim 11 defines the Mw of the superabsorbent polymer which according to the description on page 8, lines 32 to 34 is disclosed in combination with a specific polyelectrolyte, namely with a partially neutralized polyacrylic acid. The generalization of the Mw of a specific polymer to a non-specified polymer does not meet the requirements of Art. 34(2)b).

Consequently, the International Preliminary Examination Report is based on the originally filed claims 1 to 12 (Rule 70(2)c)).

Section V

The present invention refers to high internal phase polyelectrolyte emulsions which are useful for the manufacture of superabsorbent polymers (SAPs) as defined in claims 11 and 12, to a process for preparing such SAP easily applicable to absorbent structures as described in claims 1 to 8, and to the products prepared by the claimed process as disclosed in claims 9 and 10.

The following documents are taken into consideration:

D1 = US-A-4 339 371

D2 = WO 93/18223

Both documents are cited at page 2 of the description.

1. Novelty

Document D1 takes away novelty of independent product claims 11 and 12 since this

document discloses water-in-oil-emulsions containing high concentration of a water-soluble polymer. In D1, high concentration means a polymeric solid content of 40 to 60 % based upon the total emulsion weight (cf. D1, col.1, l. 42-49). The aqueous phase of the emulsion is from about 95 to 60 % (cf. D1, col.3, l.43-45) so that the polymer content of the aqueous phase falls within the range defined in claim 11 of the application. In addition, the oil phase of D1 is an inert hydrophobic liquid (cf. D1, col. 3, l.20).

Consequently, claims 11 and 12 do not fulfil the requirements of Art. 33(2) PCT.

It should be mentioned that neither D1 nor the documents cited in the International Search Report deal with a process wherein a water-in-oil-emulsion containing a hydrophilic polymer is applied to a substrate.

2. Inventive Step

The present invention provides a process for preparing a SAP from highly concentrated precursor polymers which are easily applicable to absorbent structures whereby the pattern and form of the SAP distribution can be easily designed.

The only available prior art document dealing with the application of a water-in-oil-emulsion to the surface of a substrate is D2 which is therefore considered as the nearest prior art document.

Said document, however, differs from the claimed process in that neither coalescence nor an inversion takes place creating a homogeneous film of the applied gel matrix. In addition, D2 does not disclose a step of postcrosslinking.

The inversion of the water-in-oil-emulsion matrix as set out in step (d) appears to be the key feature of the claimed process which is not suggested in D2. Hence the process and the products prepared by said process are considered to be inventive over D2. Claims 1 to 10 appear to meet the requirements of Art. 33(3) PCT.

Section VIII: Clarity

According to page 6, lines 33/34 of the description, "inverting and inversionmeans coalescing or coalescence". According to page 11, lines 23 to 26, "Coalescing the

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/04573

internal phase.....can be accomplished by any coalescing or inversion techniques...". In this context, the terms coalescence and inversion seems to be interchangeable so that claims 1 and 2 which have been drafted as separate independent claims, appear to relate effectively to the same subject-matter and to differ from each other only in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Hence, claims 1 and 2 do not meet the requirements of Article 6 PCT.

Claim 11 is unclear due to the broad term of polyelectrolyte which in the present case is directed to superabsorbent hydrophilic polymers.

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The mixture is put on the shaking machine overnight and the resulting extract is injected into a liquid chromatograph. Separation is made on a cation exchange column and the eluent is monitored with an ultraviolet detector. Quantification is made by peak areas measurement using external standard calculations with a computing integrator.

D) Particle Size

The particle sizes of the SAP's of the present invention were determined by the scanning electron microscopy (SEM) technique followed by image analysis.

Table 1 - Recipe for 1 kg Water-in-Oil Emulsion having 90 Percent Aqueous Phase

Aqueous Phase* ¹ 90 percent, based on total			
Ingredient	Weight(g)	Concentration in Formula.	Comments
Acrylic acid (AA)	263.44	29.27	wt percent b.o. aqueous Phase
Sodium hydroxide (20 percent aq.)	497.62		
Water	132.03		
Crosslinker ²			
Versenex 80	0.33	500	ppm b.o. AA
Sodium persulfate	4.48	1700	ppm b.o. AA
Hydrogen peroxide ³			ppm b.o. AA
2,2'-Azobis(2- amidinopropane) dihydrochloride ⁴	2.11	800	ppm b.o. AA
TOTAL	900.00		

*35 percent by weight solids, based on aqueous phase

WHAT IS CLAIMED IS:

1. A process for preparing superabsorbent structures comprising:

(a) preparing a high internal phase water-in oil emulsion comprising, in its aqueous dispersed phase, at least one hydrophilic monomer in aqueous solution and an initiator,

(b) polymerizing the monomer in the aqueous dispersed phase to form a precursor polymer,

(c) mixing the water-in-oil emulsion containing the precursor polymer with a post crosslinker and, optionally a plasticizing agent,

(d) applying the emulsion resulting from step (c) onto a support material,

(e) allowing or inducing coalescence of the aqueous phase under conditions sufficient to allow the emulsion to form a homogeneous polymer gel structure, and

(f) drying and post crosslinking the formed gel material at a temperature sufficient to dry and cure the material, and

(g) optionally, post-treating the material obtained in step (f) by post-heat treating the material, by surface modifying the material, by surface post-crosslinking the material, or by any combination of these post-treatments.

2. The process of Claim 1 wherein: an inversion agent is employed in step (c); and step (d) comprises spreading or casting.

3. A process according to Claims 1 or 2 wherein the inversion of the emulsion can be accomplished by 1) solvent extraction, 2) evaporation of the organic phase, 3) application of surfactant(s) having a high hydrophilic lipophilic balance (HLB), 4) application of low critical solution temperature solvents, or 5) application of metal oxide powders.

4. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by solvent extraction.

5. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by evaporation of the organic phase.

6. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one surfactant having a high hydrophilic lipophilic balance (HLB).

7. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one low critical solution temperature (solvent).

8. A process according to Claim 3 wherein the inversion of the emulsion is accomplished by the application of at least one metal oxide powder.

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9. A film prepared by the process of Claims 1 or 2.

10. An absorbent article which comprises a superabsorbent polymer film or pattern prepared from a high internal phase polyelectrolyte prepared by the process of Claims 1 or 2.

5 11. A high internal phase polyelectrolyte emulsion which useful for the manufacture of a superabsorbent polymer having a weight average molecular weight of at least 1,500,000, the emulsion having two phases: i) a continuous oil phase and ii) a dispersed aqueous phase containing polyelectrolyte, wherein the dispersed aqueous phase contains a concentration of polyelectrolyte which is from 10 to 50 percent based on the total
10 aqueous phase.

12. An emulsion according to Claim 11 wherein the oil phase is a hydrophobic organic solvent.